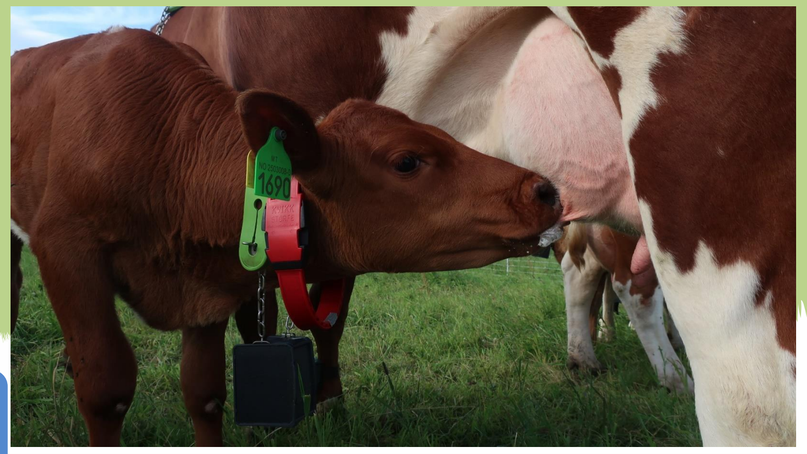

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Behaviour in dairy calves with and without their dams at pasture

27.01.2022 – Juni Rosann E. Johanssen

My PhD (aug 2020-aug 2023)

- Norwegian Centre for Organic Agriculture (Norsøk), Tingvoll, Norway
- PhD-candicate at the Norwegian University of Life Sciences, Ås, Norway

- Three cow-calf projects

SUCCEED (2020-2023), aim:

- *Establish science based and practically feasible methods to allow increased contact between cow and calf in dairy production*

Aim with my PhD:

- *Acquire new knowledge about dairy farming systems with cow-calf contact, with emphasis on cow-calf contact at pasture*

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Research question

- **Experiment:** *What effects does having cow and calf together at pasture have on the behaviour and health of cow and calf, calf weight gain, cow milk production and composition of milk?*

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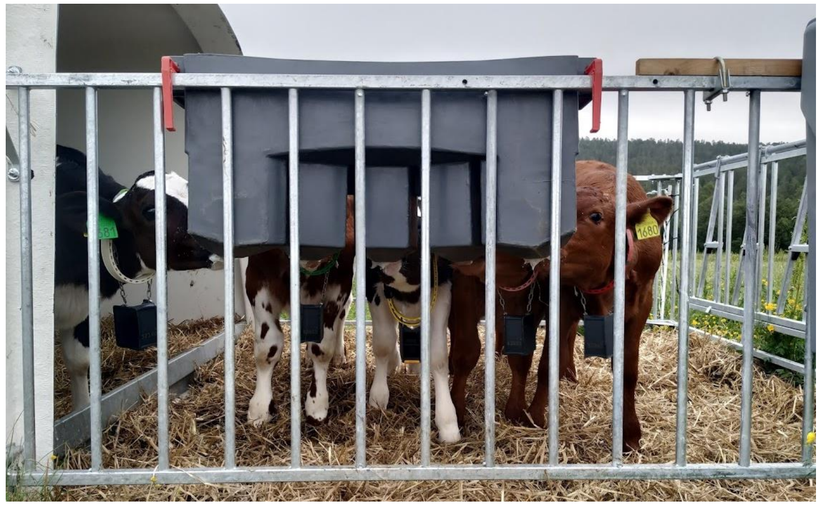
Preliminary titles for scientific articles from the experiment

Johanssen, J. R. E. et al. 2022. *Behaviour in dairy calves with and without their dams at pasture*

Johanssen, J. R. E. et al. 2023. *Effects of dairy cow-calf contact at pasture on calf weight gain, cow milk yield and composition of milk*

Co-author Johanssen, J. R. E. 2023. *Identification of dairy calf suckling behaviour by using automatic surveillance technology on pasture*



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About the experiment

- 20 cow-calf pairs, 4 groups

- **Early separation (ES):**

  - Separated within 1-3 hours after calving
  - Natural milk 4 times/day till week 6: (offered 12-14 l/calf/day)
  - Week 7: Milk 2 meals/day, 8 l/calf/day
  - Week 8: Milk 2 meals/day, 4 l/calf/day
  - Week 9: Weaned from milk

- **Cow-calf contact (CC):**

  - Together fulltime for 6 weeks (free suckling)
  - Week 7 and 8: Physical contact through fenceline (without suckling), except:
  - Week 7: 2 hours together after milking 2 x day
  - Week 8: 1 hour together after milking 2 x day
  - Week 9: Separated and weaned, cows moved to another pasture (could still hear each other, maybe see each other)

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Animals in the experiment

- Calvings 7.May-14.June, birth weight 30-56 kg
- Divided into groups by calving date
- Age variation for calves: 6-8 days within each group
- Norwegian red cattle, except 3 pairs with Holstein crosses in separate groups
- ES-cows: 1 primiparous- and 9 multiparous cows
- CC-cows: 4 primiparous- and 6 multiparous cows
- ES-calves: 6 bulls, 4 heifers
- CC-calves: 2 bulls, 8 heifers
- Out on pasture when youngest calf in group was 3-4 days

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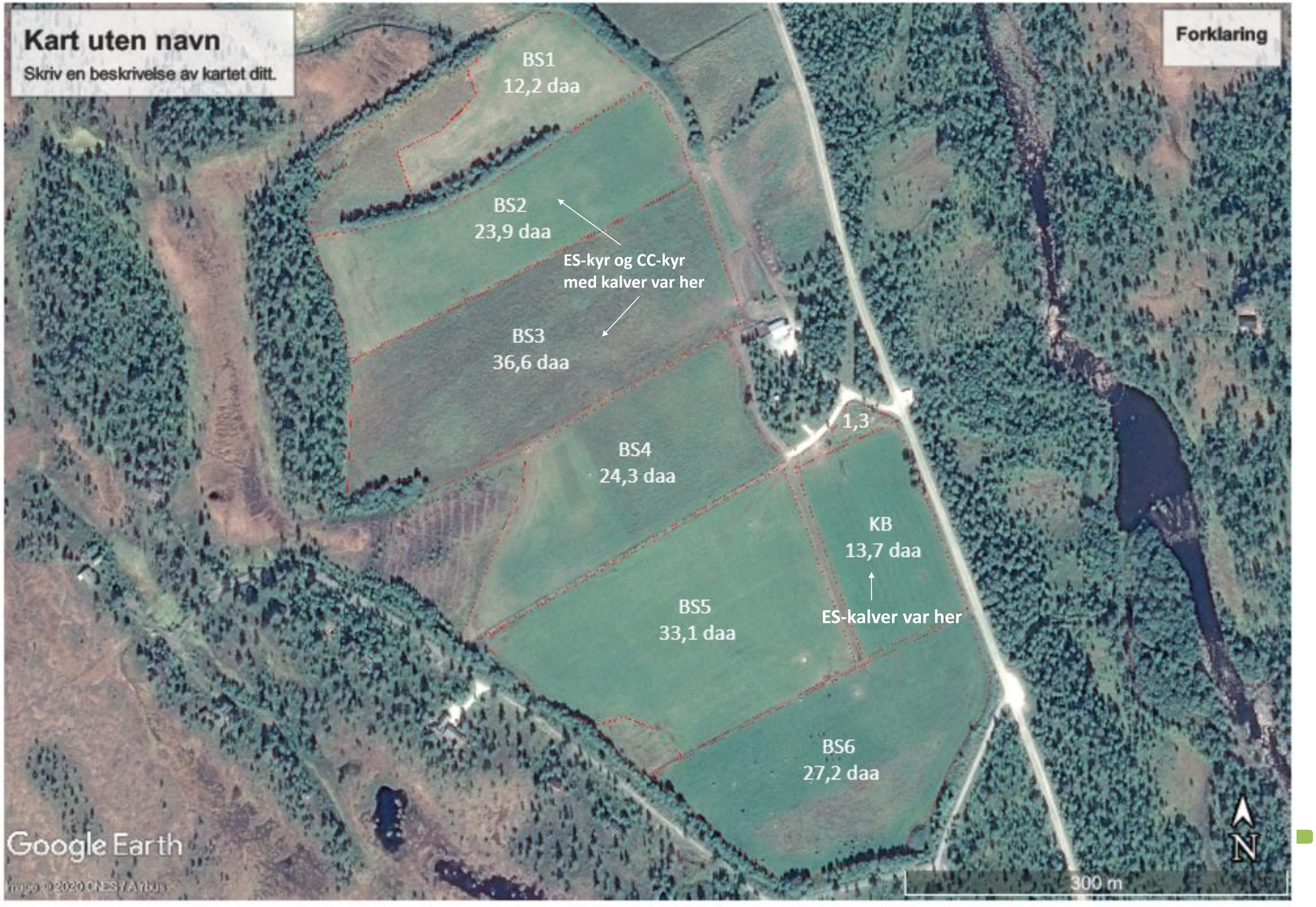
Summer farm in Nerskogen, ca 720 moh



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Calf behaviour

- Individual direct observations and registrations on pasture
- Collars with colours, same colour for calf and dam in each pair
- First day on pasture

  - Two observers

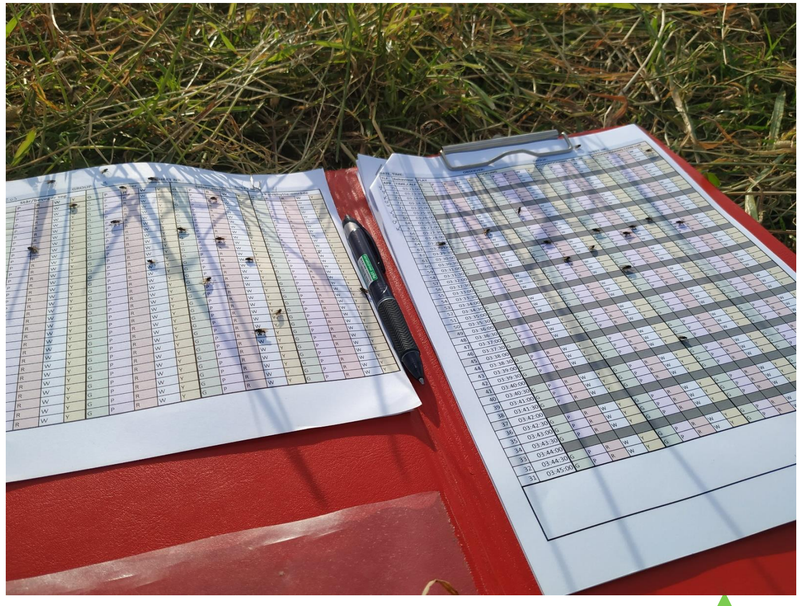
  - One period of 4 hours
- Days in week 3, 6 and 9

  - One day each week per group

  - One observer

  - 2 periods of 4 hours (06-10 & 16-20)

  - 8 hours per day
- Instantaneous sampling
- One-zero sampling



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Instantaneous sampling

- Sample point every 2. minute

Behaviours:

- In calf hutch
- Grazing
- Lying
- Standing/Moving
- Sometimes for CC-calves: Eating silage
- + in week 9: Eating hay

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One-zero sampling

- 30 seconds sample intervalls for 1,5 minute, 30 seconds break (inst.s. in break)
- Registered if behaviour happened of not in each sample

Behaviours:

- Allogrooming calf-calf
- Allogrooming calf-cow/cow-calf (CC-calves) (ex.week 9)
- Suckling (CC-calves) (ex.week 9)
- Drinking milk (ES-calves) (ex.week 9)
- Play

In addition in week 9:

- Number of incidents in each sample int. for:
- Vocalisations high pitched
- Vocalitations low pitched

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Feeding test calves week 8

- Three days for each group in week 8
- Group test, 30 min per day
- Familiar area 6*6 m outside the calf hutch with electric sheep-fence
- Four 90 l buckets, 2 cameras
- Buckets: Empty, 1,5 kg hay (novel feed), 5 kg carrots (novel feed), 5 kg concentrates (familiar feed)
- Weighing of feed before and after each test
- Continious registrations:
  - Latency to approach buckets
  - Latency to eat feed
  - Time spent eating feed or manipulating empty bucket
- We don’t have the results yet…

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Nofence-collars

- 20 cattle collars - cows
- 20 sheep/goat collars – calves
- Did NOT use fence function
- GPS-positions cows and calves
- Accelerometer data activity cows and calves
- Accelerometer data suckling CC-calves

  (Compare with behaviour registrations)

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Preliminary statistical analysis of calf behaviour week 3, 6 & 9

- Mixed Effects Model on Minitab
- Model:

  y = intercept + treatment + Group(treatment) + Calf(treatment; Group)

  + week + treatment*week + error
- Fixed factors: Treatment, Week
- Random factors: Group, Calf ID
- Responses: The behavours:

  - Use of calf hutch, Grazing, Lying, Standing/moving,

  Allogrooming calf-calf, Play

- Will do more analysis later….

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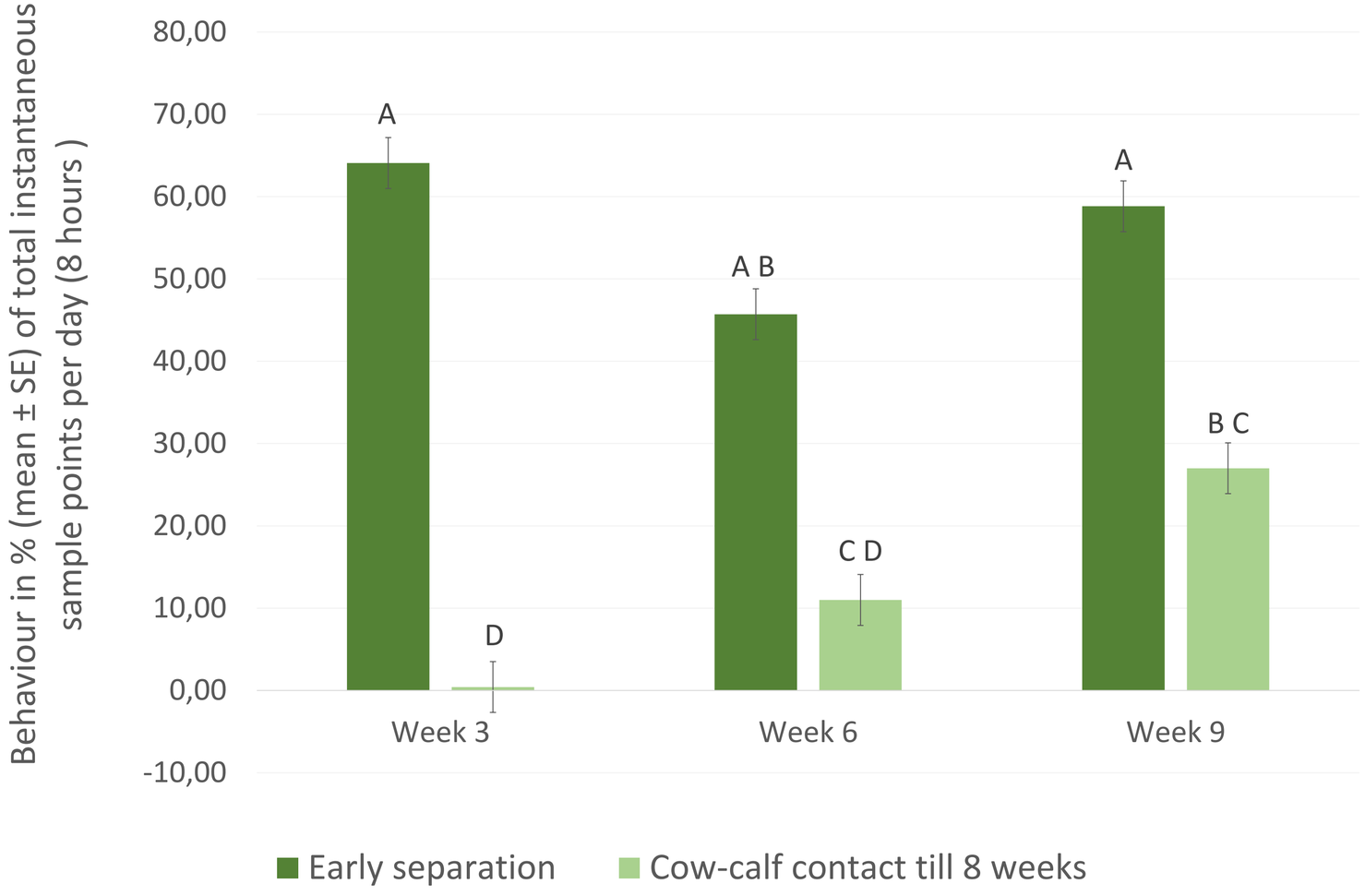
Calves use of calf hutch, week 3, 6 & 9



- Means with common letters are not significantly different (P< 0.05) according to Tukey's test

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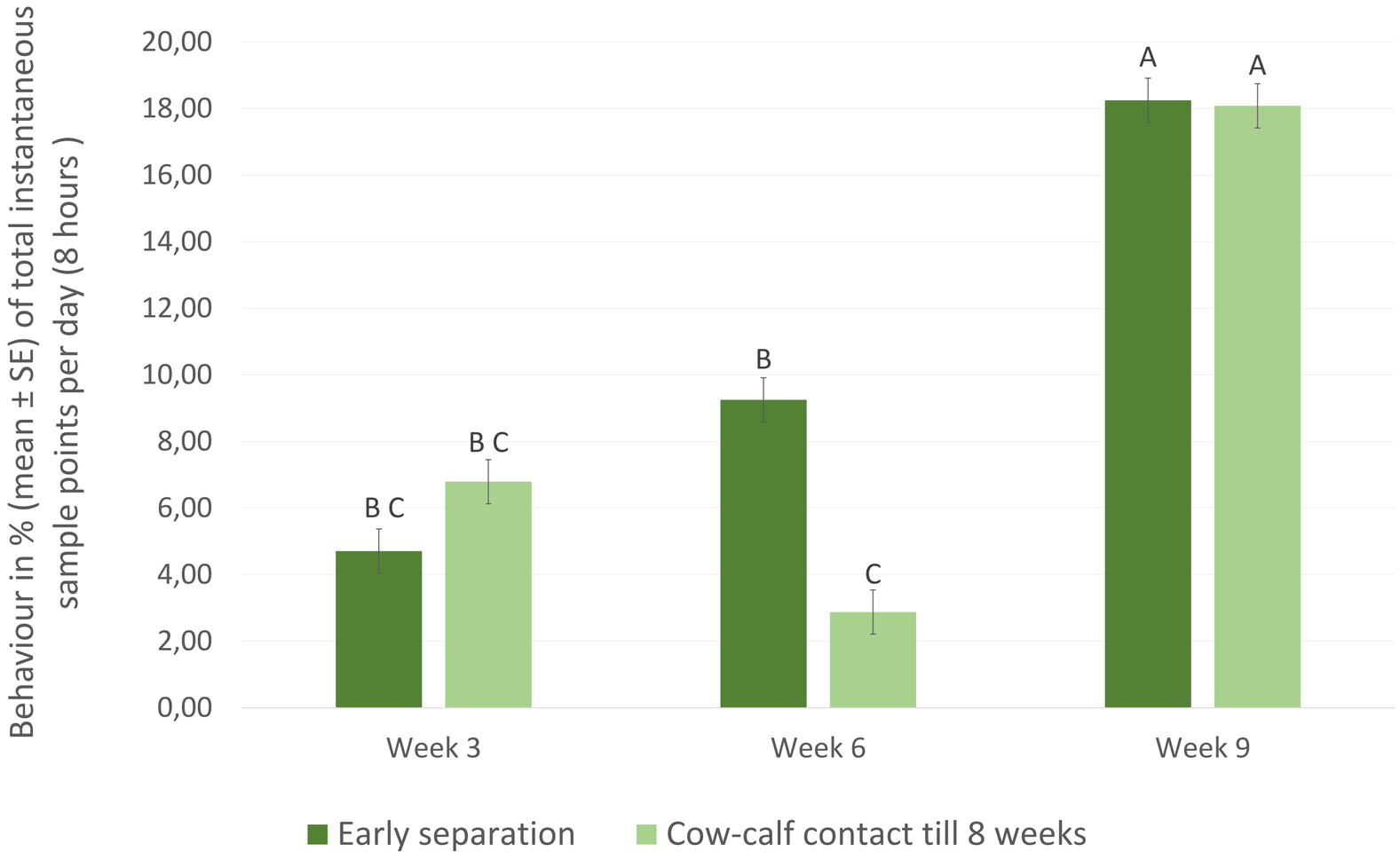
Calves grazing, week 3, 6 & 9



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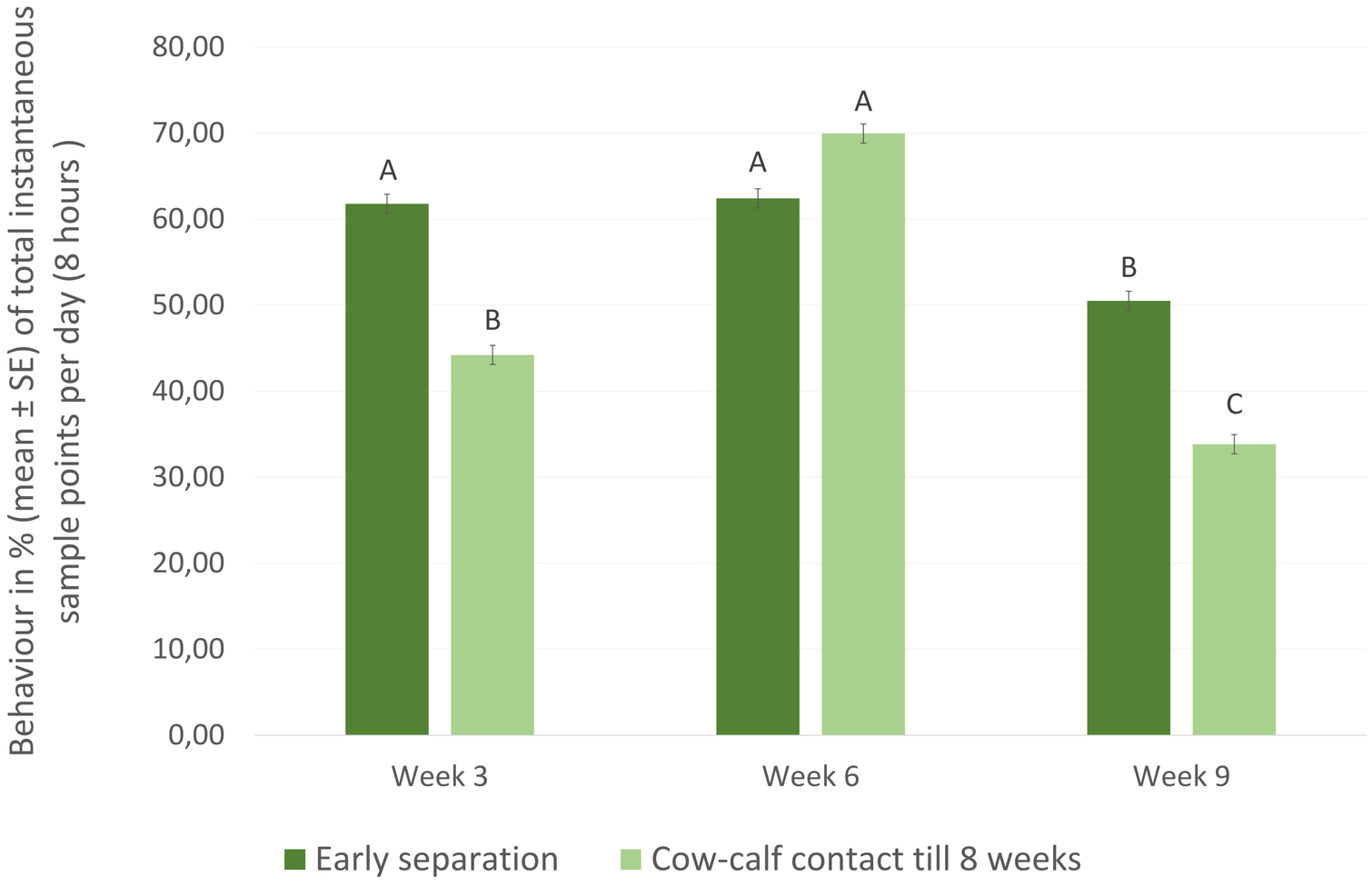
Calves lying, week 3, 6 & 9



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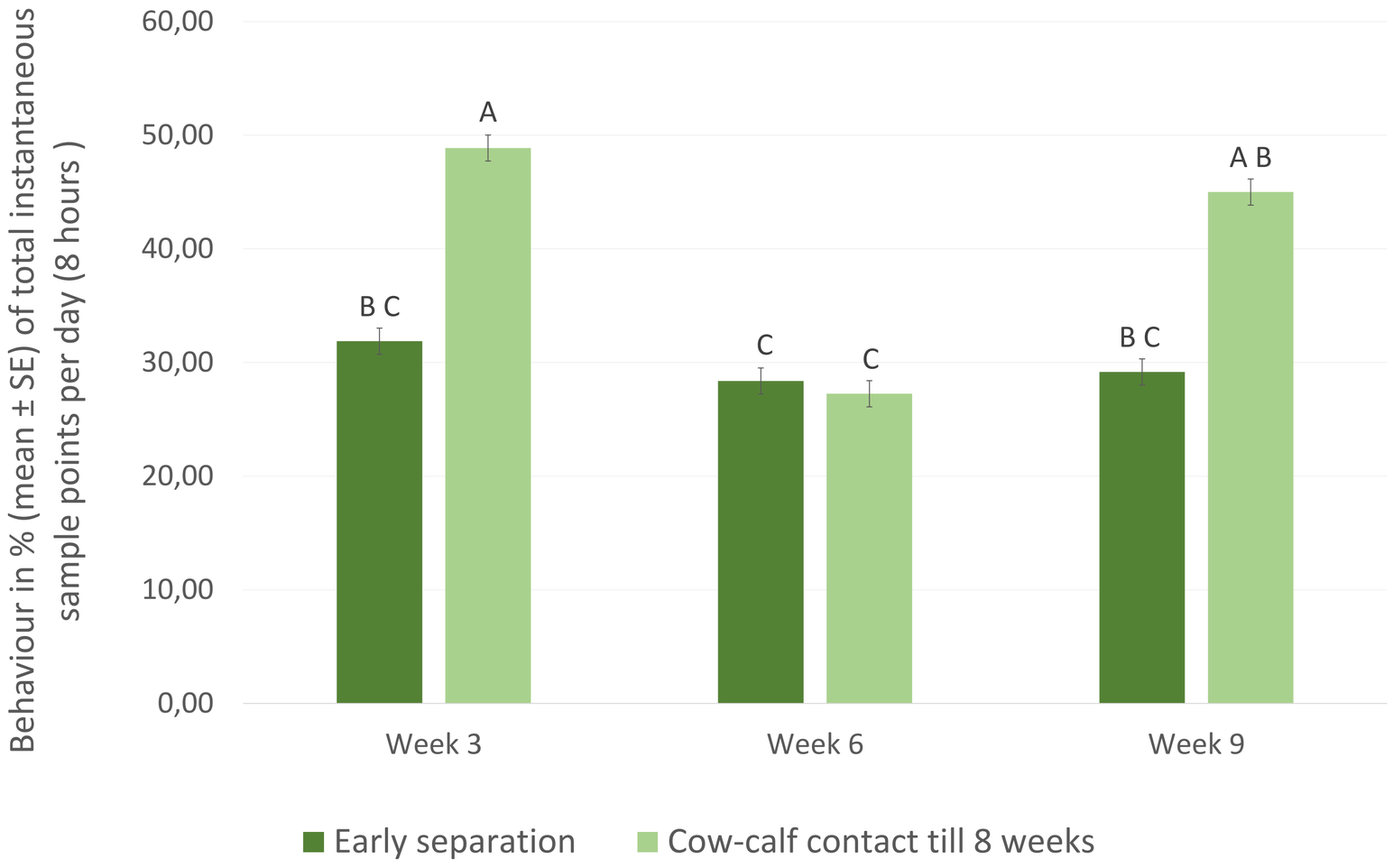
Calves standing/moving, week 3, 6 & 9



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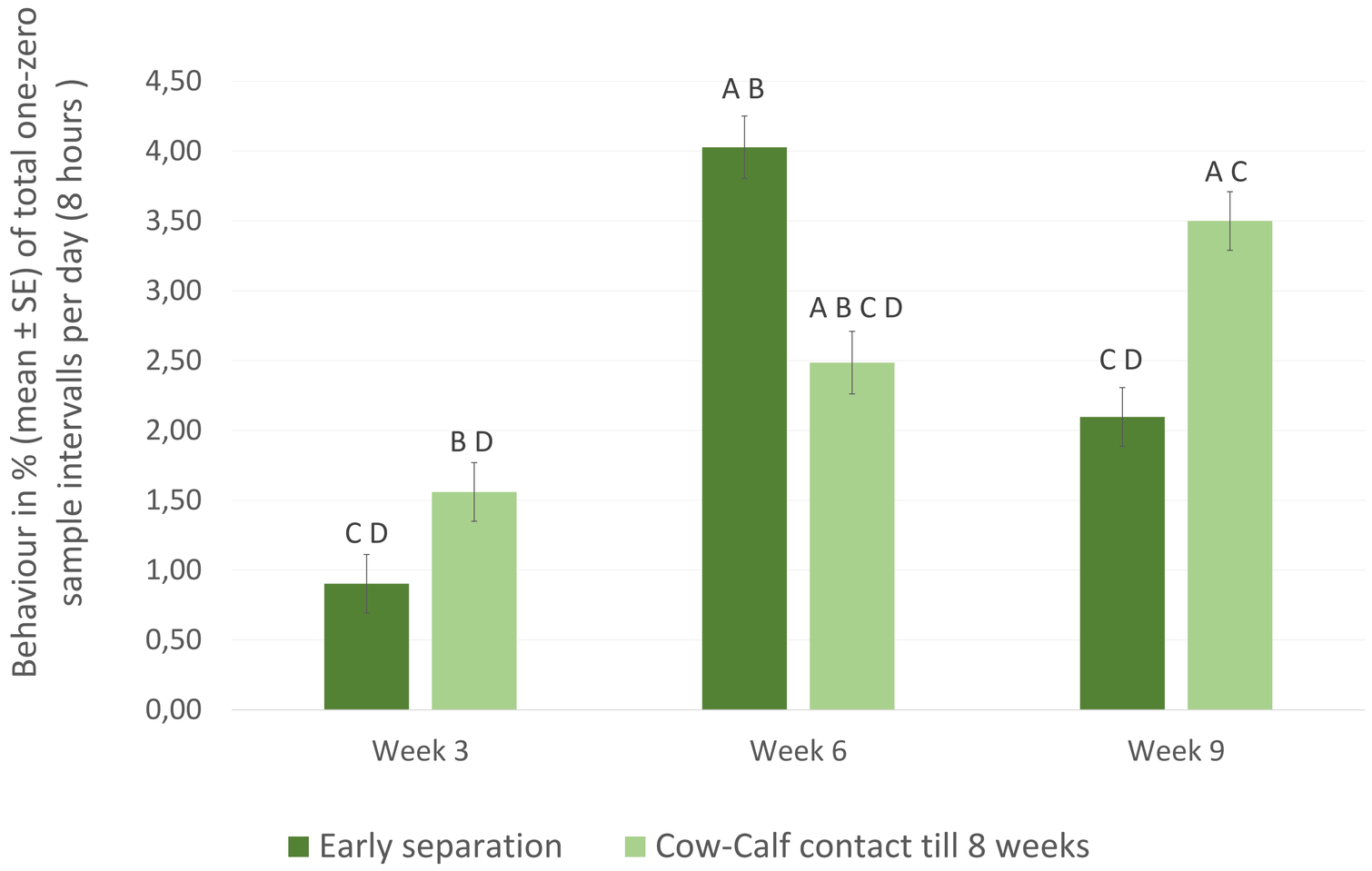
Allogrooming calf-calf, week 3, 6 & 9



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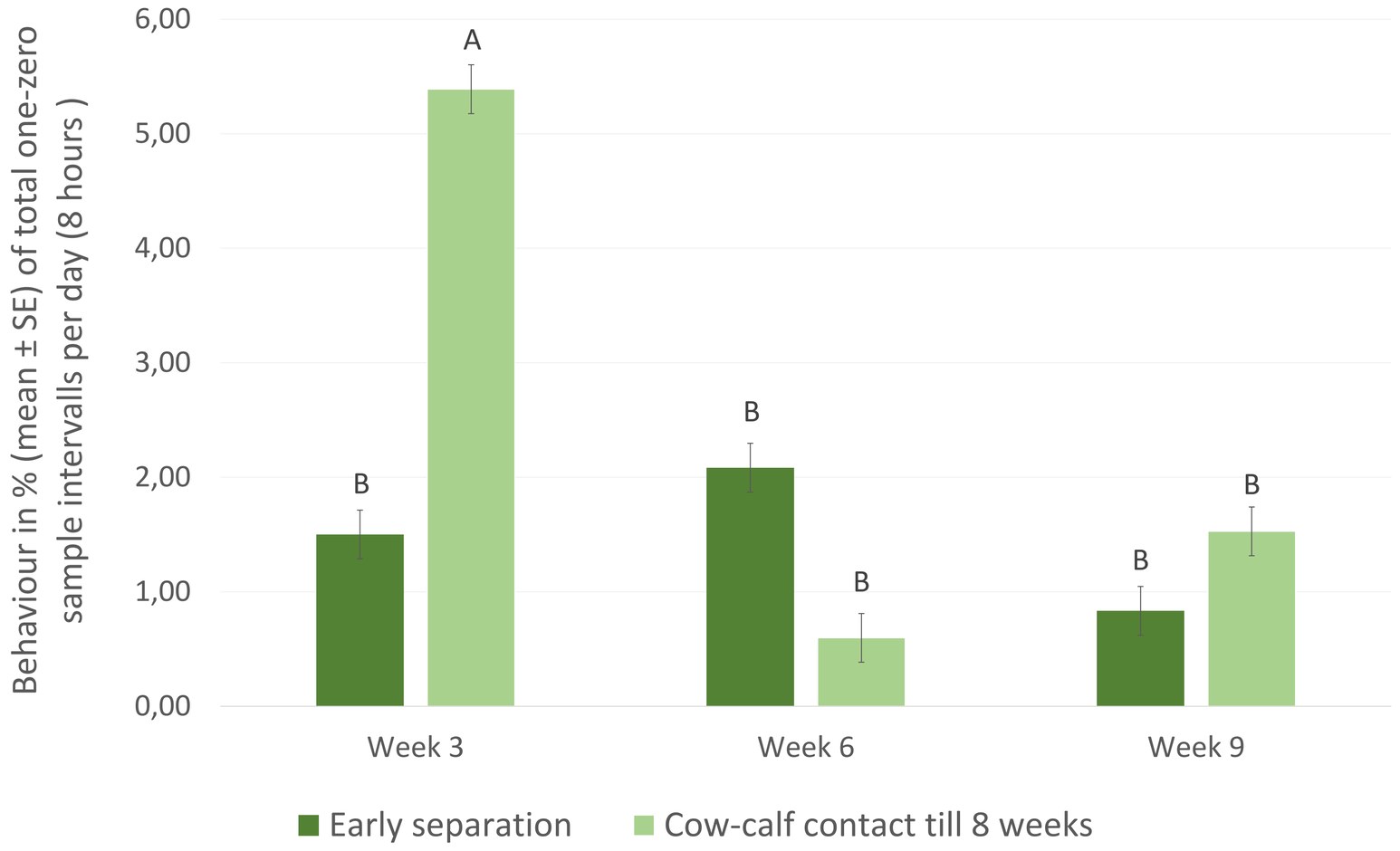
Calves play behaviour, week 3, 6 & 9



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Project financing

The Norwegian Research Council, Research funding for the agriculture- and food industry (FFS-JA)

- SUCCEED

Regional Research fund Mid-Norway

- Kalvelykke (Calf Happiness)

The Norwegian Animal Protection Alliance's Research Fund

- Dairy cow and calf together at pasture

Forskningsrådet

REGIONALE FORSKNINGSFOND MIDT-NORGE

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To be continued….

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